# PASSIVE EXPERIMENT DEVELOPMENT

## Design Phase

In order to design a space experiment the following experimenter and NASA supplied items will be involved:

***NASA*** Supplied:
- Documentation
- Internet Data Base

***Experimenter*** Supplied:
- IBM PC compatible computer with Microsoft Windows 3.1x or Windows 95 strongly recommended.
- Internet Access strongly recommended.

An experiment emblem or decal may be designed which symbolizes the experiment concept. Experiments must be designed in accordance with the design constraints outlined in the NASA Documentation.

Experiments must be designed to fit within the SEM Experiment Module by one of two methods.

Method 1 uses NASA provided **"Space Capsules"** to enclose test articles. The Space Capsules are clear, sealable polycarbonate vials 1.0 inch in diameter and 3.0 inches in depth. A total of twenty-two Space Capsules may be packed in an individual Experiment Module using silicone foam cushions fabricated at NASA specifically for the SEM program. Figure XX shows the NASA Space Capsule and how it can be packaged within an Experiment Module.

Method 2 utilizes the Module Cover as an **Experiment Mounting Plate**. The free space available for experiment apparatus in the Module experiment compartment, termed the **"Experiment Envelope**,**"** is a precisely defined volume delineated on the inboard surface of the Experiment Mounting Plate and extending 3.25 inches below the inboard surface of the Mounting Plate. Figure XX shows an overview of the Experiment Envelope as it fits within the Experiment Module. Figure XX illustrates the perimetric dimensions of the Experiment Envelope as outlined on the Experiment Mounting Plate. Experiments are designed to be mounted to the inboard surface of the Experiment Mounting Plate using integration hardware (screws, nuts, and washers) supplied to the experimenter by NASA.

**Mechanical Specifications:**

METHOD 1
1. Test Articles small enough to fit through the neck of the Space Capsule and inside of the Capsule:

Capsule neck size: 0.5 inch diameter
Capsule inside depth: 3.0 inches

2. Experiment Emblem: 8.0 inches by 2.9 inches

METHOD 2
1. Experiment Envelope:
Mounting plate surface: Approximately 85 square inches (550 square cm)(see drawing)

Depth of Experiment compartment below mounting plate: 3.25 inches (8.2 cm)

2. Maximum weight of experimenter hardware: 6 lb. (2.7 Kg.)

3. Experiment Integration: Experiment to be attached to Experiment Mounting Plate using NASA supplied Integration Hardware as specified in the Experiment Integration Instructions. The Integration Hardware is defined as follows:

Nuts, Self-locking, #6-32 per MS21043-06
Washers, sealing, #6 per NAS1523C-06B
Screws, panhead, #6-32, .375 long per MS51957-28
Screws, panhead, #6-32, .438 long per MS51957-29
Screws, panhead, #6-32, .500 long per MS51957-30
Screws, panhead, #6-32, .625 long per MS51957-31
Screws, panhead, #6-32, .750 long per MS51957-32

4. Experiment Emblem: 8.0 inches by 2.9 inches

**Electrical Specifications: NONE**

**Environmental Limitations:** See Experiment Environment Section

**Safety Limitations:** See Safety Considerations section

**Access to Internet Data Base strongly recommended**

## Hardware Phase:

Participants selected for the **hardware phase** will receive a package of hardware from NASA to support the construction and development of the experiment created in the SEM Design Phase. The contents of the package depends on the proposed experiment design.

Experimenters with designs using the NASA Experiment Mounting Plate to mount experiment components receive a package including the Experiment Mounting Plate, Integration Hardware (screws, nuts and washers) as specified in the selected design, an Emblem Mount and Integration Instructions**.**

> It is the experimenters responsibility to drill into the Experiment Mounting Plate and attach the experiment using the NASA provided integration hardware and Integration Instructions.

Experimenters with designs using the NASA Space Capsules receive a package including the number of Space Capsules specified in the selected design, an Emblem Mount, and Instructions. Experimenters proposing to use the Space Capsules packaged in the NASA foam cushions will receive 22 Capsules in their package.

> It is the experimenters responsibility to insert their test articles into the Space Capsules and tighten the Capsule lids.

All experimenters have the option to fabricate an experiment decal and attach it to the NASA provided Emblem Mount.

> If an emblem is desired, it is the experimenters responsibility to design and manufacture their experiment emblem, attach the emblem to the NASA provided Emblem Mount, and send the Emblem Mount back to NASA for integration into the SEM Experiment Module.

In order to develop and test a space experiment the following experimenter and NASA supplied items will be involved:

***NASA*** Supplied:
- Space Capsules, if required
- Experiment Mounting Plate, if required
- Integration Hardware, if required
- Documentation
- Internet Data Base
- Emblem mounting plate, if requested

***Experimenter*** Supplied:
- Test Articles for Space Capsules, if used
- Experiment Apparatus, if used with Experiment Mounting Plate
- IBM PC compatible computer with Microsoft Windows 3.1x or Windows 95 strongly recommended.
- Internet Access strongly recommended.
- Experiment Emblem, if used

## Flight Phase:

Experimenters selected for participation in the **flight phase** will submit their experiments and emblem mounts to NASA/SSPP to be installed in modules.

> If an emblem is desired, it is the experimenters responsibility to design and manufacture their experiment emblem, attach the emblem to the NASA provided Emblem Mount, and send the Emblem Mount back to NASA for integration into the SEM Experiment Module.

Experiments using the Space Capsules will send NASA the Capsules with the test articles enclosed. Following Shuttle spaceflight of the SEM payload, the experiment hardware and emblem mount will be returned to the experimenter.